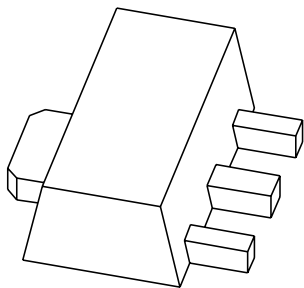


# DATA SHEET



**PBSS5250X**

**50 V, 2 A**

**PNP low  $V_{CEsat}$  (BISS) transistor**

Objective specification

2003 Jun 17

50 V, 2 A  
PNP low  $V_{CEsat}$  (BISS) transistor

PBSS5250X

FEATURES

- SOT89 (SC-62) package
- Low collector-emitter saturation voltage  $V_{CEsat}$
- High collector current capability:  $I_C$  and  $I_{CM}$
- Higher efficiency leading to less heat generation
- Reduced printed-circuit board requirements.

APPLICATIONS

- Power management
  - DC/DC converters
  - Supply line switching
  - Battery charger
  - LCD backlighting.
- Peripheral drivers
  - Driver in low supply voltage applications (e.g. lamps and LEDs).
  - Inductive load driver (e.g. relays, buzzers and motors).

DESCRIPTION

NPN low  $V_{CEsat}$  transistor in a SOT89 plastic package.  
NPN complement: PBSS4250X.

MARKING

TYPE NUMBER	MARKING CODE <sup>(1)</sup>
PBSS5250X	*1L

Note

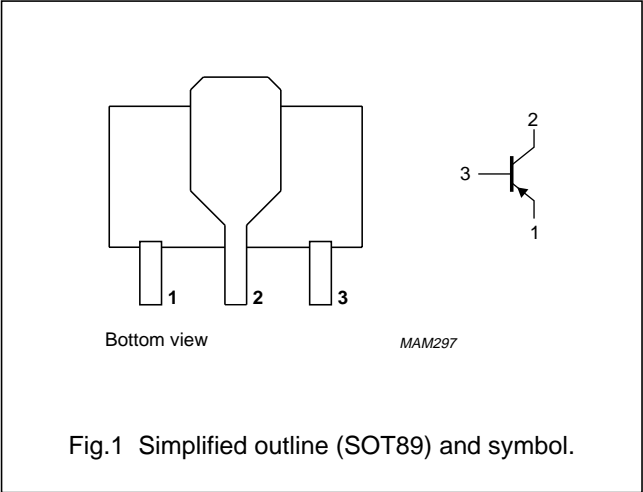
1. \* = p : made in Hong Kong  
\* = t : made in Malaysia  
\* = W : made in China.

QUICK REFERENCE DATA

SYMBOL	PARAMETER	MAX.	UNIT
$V_{CEO}$	collector-emitter voltage	−50	V
$I_C$	collector current (DC)	−2	A
$I_{CM}$	peak collector current	−5	A
$R_{CEsat}$	equivalent on-resistance	160	mΩ

PINNING

PIN	DESCRIPTION
1	emitter
2	collector
3	base



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## LIMITING VALUES

In accordance with the Absolute Maximum Rating System (IEC 60134).

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
$V_{CBO}$	collector-base voltage	open emitter	–	–50	V
$V_{CEO}$	collector-emitter voltage	open base	–	–50	V
$V_{EBO}$	emitter-base voltage	open collector	–	–5	V
$I_C$	continuous collector current (DC)		–	–2	A
$I_{CM}$	peak collector current	$T_{j\ max}$	–	–5	A
$I_B$	continuous base current (DC)		–	–0.5	A
$P_{tot}$	total power dissipation	$T_{amb} \leq 25\ ^\circ\text{C}$			
		note 1	–	550	mW
		note 2	–	1	W
$T_j$	junction temperature		–	150	$^\circ\text{C}$
$T_{amb}$	operating ambient temperature		–65	+150	$^\circ\text{C}$
$T_{stg}$	storage temperature		–65	+150	$^\circ\text{C}$

## Notes

- Device mounted on a FR4 printed-circuit board; single-sided copper; tinplated; standard footprint.
- Device mounted on a FR4 printed-circuit board; single-sided copper; tinplated; mounting pad for collector 1 cm<sup>2</sup>.

## THERMAL CHARACTERISTICS

SYMBOL	PARAMETER	CONDITIONS	VALUE	UNIT
$R_{th\ j-a}$	thermal resistance from junction to ambient	in free air		
		note 1	225	K/W
		note 2	125	K/W
$R_{th\ j-s}$	thermal resistance from junction to soldering point		16	K/W

## Notes

- Device mounted on a FR4 printed-circuit board; single-sided copper; tinplated; standard footprint.
- Device mounted on a FR4 printed-circuit board; single-sided copper; tinplated; mounting pad for collector 1 cm<sup>2</sup>.

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**CHARACTERISTICS** $T_j = 25\text{ °C}$ ; unless otherwise specified.

SYMBOL	PARAMETER	CONDITIONS	MIN.	MAX.	UNIT
$I_{CBO}$	collector cut-off current	$V_{CB} = -50\text{ V}; I_E = 0$	–	–100	nA
		$V_{CB} = -50\text{ V}; I_E = 0; T_j = 150\text{ °C}$	–	–50	$\mu\text{A}$
$I_{CES}$	collector cut-off current	$V_{CE} = -50\text{ V}; V_{BE} = 0$	–	–100	nA
$I_{EBO}$	emitter cut-off current	$V_{EB} = -5\text{ V}; I_C = 0$	–	–100	nA
$h_{FE}$	DC current gain	$V_{CE} = -2\text{ V}$ $I_C = -0.1\text{ A}$	200	–	
		$I_C = -0.5\text{ A}$	200	–	
		$I_C = -1\text{ A}$ ; note 1	200	–	
		$I_C = -2\text{ A}$ ; note 1	100	–	
$V_{CEsat}$	collector-emitter saturation voltage	$I_C = -0.5\text{ A}; I_B = -50\text{ mA}$	–	–90	mV
		$I_C = -1\text{ A}; I_B = -50\text{ mA}$	–	–250	mV
		$I_C = -2\text{ A}; I_B = -100\text{ mA}$	–	–380	mV
		$I_C = -2\text{ A}; I_B = -200\text{ mA}$ ; note 1	–	–320	mV
$R_{CEsat}$	equivalent on-resistance	$I_C = -2\text{ A}; I_B = -200\text{ mA}$ ; note 1	–	160	$\text{m}\Omega$
$V_{BEsat}$	base-emitter saturation voltage	$I_C = -2\text{ A}; I_B = -100\text{ mA}$	–	–1.1	V
$V_{BEon}$	base-emitter turn-on voltage	$V_{CE} = -2\text{ V}; I_C = -1\text{ A}$	–1.1	–	V
$f_T$	transition frequency	$I_C = -100\text{ mA}; V_{CE} = -5\text{ V};$ $f = 100\text{ MHz}$	100	–	MHz
$C_c$	collector capacitance	$V_{CB} = -10\text{ V}; I_E = I_e = 0; f = 1\text{ MHz}$	–	35	pF

**Note**1. Pulse test:  $t_p \leq 300\text{ }\mu\text{s}$ ;  $\delta \leq 0.02$ .

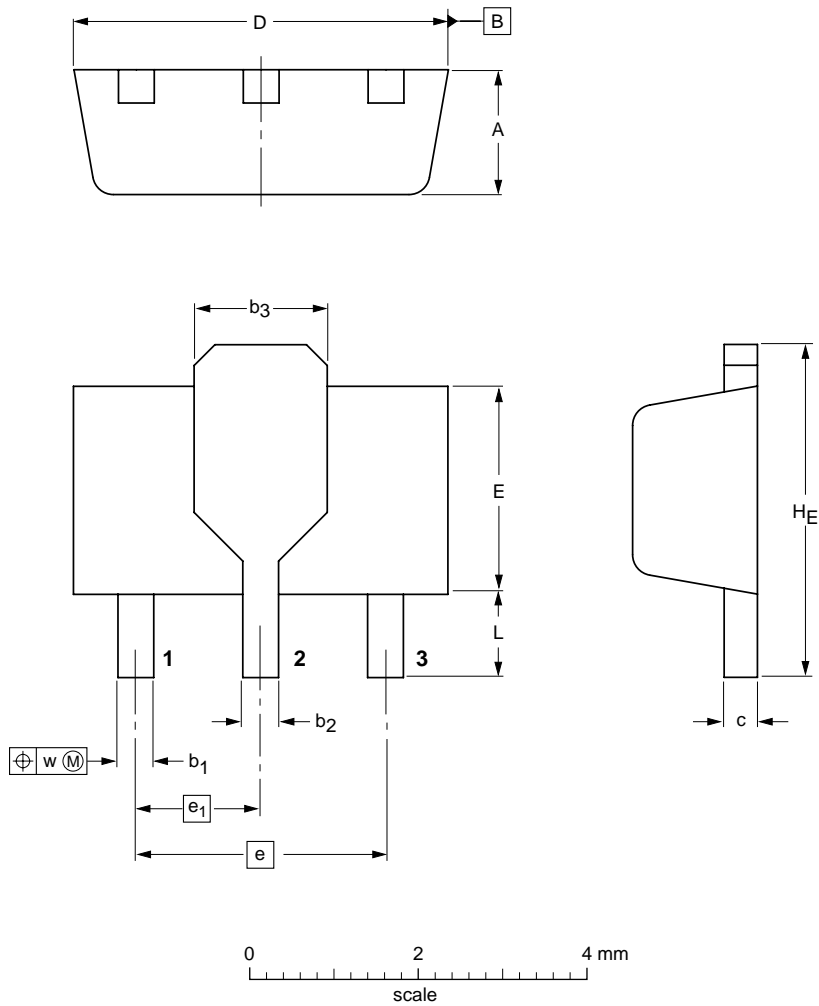
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PACKAGE OUTLINE


Plastic surface mounted package; collector pad for good heat transfer; 3 leads

SOT89



DIMENSIONS (mm are the original dimensions)

UNIT	A	b <sub>1</sub>	b <sub>2</sub>	b <sub>3</sub>	c	D	E	e	e <sub>1</sub>	H <sub>E</sub>	L min.	w
mm	1.6 1.4	0.48 0.35	0.53 0.40	1.8 1.4	0.44 0.37	4.6 4.4	2.6 2.4	3.0	1.5	4.25 3.75	0.8	0.13

OUTLINE VERSION	REFERENCES				EUROPEAN PROJECTION	ISSUE DATE
	IEC	JEDEC	EIAJ			
SOT89		TO-243	SC-62			97-02-28 99-09-13

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LEVEL	DATA SHEET STATUS <sup>(1)</sup>	PRODUCT STATUS <sup>(2)(3)</sup>	DEFINITION
I	Objective data	Development	This data sheet contains data from the objective specification for product development. Philips Semiconductors reserves the right to change the specification in any manner without notice.
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PBSS5250X

**NOTES**

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